

PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 497810 GWW/kaj	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. PCT/NZ2003/000290	International Filing Date (day/month/year) 22 December 2003	Priority Date (day/month/year) 20 December 2002
International Patent Classification (IPC) or national classification and IPC Int. Cl. ⁷ B65B 31/02, 43/26, 57/00		
Applicant SEALED AIR (NZ) LIMITED et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

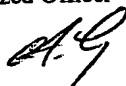
2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 11 sheet(s).

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 21 June 2004	Date of completion of the report 14 April 2005
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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/NZ2003/000290

I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed.
- ☒ the description, pages 1-29 as originally filed,
pages , filed with the demand,
pages , received on with the letter of
- ☒ the claims, pages , as originally filed,
pages , as amended (together with any statement) under Article 19,
pages , filed with the demand,
pages 30-40 received on 21 March 2005 with the letter of 21 March 2005
- ☒ the drawings, pages 1/29-29/29 as originally filed,
pages , filed with the demand,
pages , received on with the letter of
- ☐ the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , received on with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☒ not complied with for the following reasons:

The international application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept. In coming to this conclusion the International Examining Authority has found that there are different inventions as follows:

1. Claims 1 to 28 are directed to an apparatus or method for vacuum packing a product in which upstream product information is acquired relating to characteristics of the product and a pack opener is opened to suit the product characteristics prior to presentation into the vacuum packaging machine. It is considered that the opening of the pack in relation to the product characteristics comprises a first "special technical feature".
2. Claims 29 and 30 are directed to an apparatus or method for vacuum packing a product in which upstream product information is acquired relating to characteristics of the product and two or more generally parallel load conveyors move products into packs, the number of conveyors used depending on the product size. It is considered that the selective use of multiple conveyors dependent on product size comprises a second "special technical feature".
3. New claims 31 to 58 are directed to an apparatus or method for vacuum packing a product in which upstream product information is acquired relating to characteristics of the product and a pack opener is opened to suit the product characteristics prior to presentation into the vacuum packaging machine. It is considered that the pack opener arranged to automatically pick up individual packs from a supply of packs comprises a third "special technical feature".

These groups are not so linked as to form a single general inventive concept. The common concept linking together these groups of claims is vacuum packaging wherein product characteristics are acquired upstream of packaging. However this concept is not novel in the light of many applications in the art using product characteristics acquired upstream to control functions of the packaging. In particular, see US 3872644 (GIRAUDI et al) which uses the product characteristics to indicate pack size and open the pack to suit. Therefore these claims lack unity, a posteriori.

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
- ☐ the parts relating to claims Nos.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims 1-58	YES
	Claims	NO
Inventive step (IS)	Claims 1-58	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-58	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

The following documents identified in the International Search Report have been considered for the purposes of this report:

- (D1) US 3872644 A (GIRAUDI et al) 25 March 1975
- (D2) WO 2000/0207706 A2 (CRYOVAC INC) 18 May 2000
- (D3) US 5255495 A (KOVACS) 26 October 1993
- (D4) US 4543766 A (BOSHINSKI) 1 October 1985

NOVELTY (N) AND INVENTIVE STEP (IS): Claims 1-28 (YES)

The invention of amended claim 1 relates to vacuum packaging wherein upstream information about the product to be packed is used to control a pack opener to open the mouth of a pack to an extent based on the information. The invention is characterised by the products being delivered into the open packs as the open packs are simultaneously delivered into the vacuum packaging machine or so that the products are delivered into the open packs which are already at least partially entered into the vacuum packaging machine.

None of the above documents disclose all the essential features of the invention as now defined.

The closest prior art document (D1) discloses an apparatus and method for packaging products including a vacuum packaging machine for vacuum sealing product packages, an upstream information acquiring stage arranged to acquire information on one or more characteristics of the product such a size, a pack opener arranged to open the mouth of each pack to a controlled extent based on the information acquired comprising fingers to open the packs, the packs being selected from a sub-system to supply plastic on-line bags selected for a width selected for the size of individual products.

Consequently the invention of claims 1 to 28 is novel and involves an inventive step over the above prior art documents (D1) to (D4).

(Continued on supplemental sheet)

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. Independent claims 29 and 30 do not provide an explicit relationship between acquiring information on characteristics of the products and the basis for the selection of a fewer number of conveyors for small products and a greater number of conveyors for large products.

2. New independent claims 31 and 49 do not fully define the invention described. It is considered that all of the essential features of the invention as now defined in amended claim 1 have not been included in these independent claims. That is, the feature of the products being delivered into the open packs as the open packs are simultaneously delivered into the vacuum packaging machine is considered to be an essential feature of the invention.

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of Box V**NOVELTY (N) and INVENTIVE STEP (IS) claims 29 and 30 (YES)**

Claim 29 defines an apparatus for packing products including a vacuum packaging machine for performing a vacuum sealing operation on product packages and an upstream product information stage on a packing line that acquires information relating to characteristics of the products and two or more generally parallel load conveyors that deliver products into the machine, by less conveyors for small products and more conveyors for larger products. Claim 30 defines a method having steps that would use such an apparatus.

None of the prior art, either singly or in combination discloses or suggests an apparatus or method with conveyors as defined.

The closest prior art document (D1) discloses an apparatus for packing products including a vacuum packaging machine for performing a vacuum sealing operation on product packages and an upstream product information stage on a packing line that acquires information relating to characteristics of the products and two parallel load conveyors that deliver products into the machine, but the conveyors deliver alternate products into the vacuum packaging machine rather than selectively operating based on product size.

Consequently the subject matter of claims 29 and 30 is new and not obvious and meets the requirements of Articles 33(2) and (3) of the PCT with regard to novelty and inventive step.

NOVELTY (N) AND INVENTIVE STEP (IS): Claims 31-58 (YES)

The invention of new independent claims 31 and 49 also relates to apparatus and method for vacuum packaging products wherein upstream information about the product to be packed is used to control a pack opener to open the mouth of a pack to an extent based on the information. The invention of these claims is characterised by the pack opener being arranged to automatically pick up individual packs from a supply of packs, opening the packs based on the information about the product, delivering the products into the open packs and then into the vacuum packaging machine or delivering the products into the open packs which are already at least partially entered into the vacuum packaging machine.

None of the above documents disclose all the essential features of this invention defined in new claims 31 to 58.

The closest prior art document (D1) discloses an apparatus and method for packaging products including a vacuum packaging machine for vacuum sealing product packages, an upstream information acquiring stage arranged to acquire information on one or more characteristics of the product such a size, a pack opener arranged to open the mouth of each pack to a controlled extent based on the information acquired comprising fingers to open the packs, the packs being selected from a sub-system to supply plastic on-line bags selected for a width selected for the size of individual products.

Consequently the invention of claims 31 to 58 is novel and involves an inventive step over the above prior art documents (D1) to (D4).

INDUSTRIAL APPLICABILITY(IA): Claims 1-58 (YES)

The inventions of claims 1 to 58 meet the requirements of industrial applicability because the apparatuses and methods can be made or used in industry.

CLAIMS:

1. Apparatus for packing products including:
 - 5 a vacuum packaging machine for performing a vacuum sealing operation on product packages,
an upstream product information acquisition stage arranged to acquire information relating to one or more characteristics of products on a product packing line, and
10 a pack opener arranged to open the mouth of each pack to a controlled extent based on information relating to products being packed acquired at the upstream product information acquisition stage, and to present the pack so that the products are delivered into the open packs as the open packs are simultaneously delivered into the vacuum
15 packaging machine, or so that the products are delivered into the open packs which are already at least partially entered into the vacuum packaging machine.
 2. Apparatus according to claim 1 wherein the pack opener includes one or more parts which insert into the mouth of each pack and more to open the pack.
20
 3. Apparatus according to claim 2 wherein the parts which insert into the mouth of each pack comprise fingers which insert into the mouth of each pack.
 4. Apparatus according to any one of claims 1 to 3 wherein the product information
25 acquisition stage is arranged to acquire any one or more of height information, width information, height and width information, height, width and length information, volume or shape information, or weight information, in relation to the products.
 5. Apparatus according to any one of claims 1 to 4 including a sub-system for
30 supplying packs to the packing apparatus sequentially as individual products approach the packing apparatus on a conveyor.

6. Apparatus according to any one of claims 1 to 5 including a sub-system for making the packs on-line to a length tailored to the size of individual products by cutting and sealing bags from tubular stock.
- 5 7. Apparatus according to any one of claims 1 to 6 including a sub-system for supplying on-line bags of two or more widths, to a width selected for the size of individual products.
8. Apparatus according to any one of claims 1 to 7 wherein the packs are plastic
10 bags or sacks.
9. Apparatus according to any one of claims 1 to 8 also including two or more generally parallel conveyors arranged to deliver products of different sizes into the packs, by a lesser number of the conveyors for smaller products and a greater number
15 of the conveyors for larger products.
10. Apparatus according to claim 9 comprising two parallel conveyors one of which is arranged to carry smaller products into the packs and both of which are activated to run in parallel to carry larger products into the packs.
20
11. Apparatus according to claim 9 including three or more generally parallel conveyors including a centre conveyor flanked on either side by one or more other conveyors.
- 25 12. Apparatus according to any one of claims 9 to 11 wherein the conveyors are arranged to deliver products into the packs by telescoping or moving forward into the packs to an extent dependent upon the size of the product, based on product size information previously acquired at the upstream product information acquisition stage.
- 30 13. Apparatus according to any one of claims 1 to 12 wherein the vacuum packaging machine includes a plurality of vacuum chambers each arranged to receive at least one unsealed product package and operable to perform an independent vacuum sealing

operation on the product package(s), each vacuum chamber having a longitudinal direction defined by a direction of travel of the respective product package(s) through the chamber, each vacuum chamber having therein a heat seal assembly for forming a heat seal across the product package(s) which extends transversely to said longitudinal
5 direction.

14. Apparatus as claimed in claim 13, wherein the machine includes vacuum chambers which are arranged generally vertically one above each other.

10 15. Apparatus as claimed in either one of claim 13 and 14, wherein the machine is configured to operate one of the vacuum chambers to perform the vacuum sealing operation while another of the vacuum chambers is open for loading and unloading of product package(s).

15 16. Apparatus as claimed in any one of claims 13 to 15, wherein a heat seal assembly in each vacuum chamber is located at or adjacent the end of the chamber adjacent the infeed conveyor(s), and the infeed conveyor(s) is/are configured to load the product package(s) into the chamber with the unsealed portion(s) of the package(s) trailing.

20 17. Apparatus as claimed in any one of claims 1 to 16, arranged to simultaneously unload a sealed product package from a selected vacuum chamber and while loading another unsealed product package into the selected vacuum chamber.

25 18. Apparatus as claimed in claim 17 including two vertically-stacked vacuum chambers, an infeed conveyor and an outfeed conveyor, the vacuum chambers being synchronously vertically moveable between a loading/unloading position adjacent and between the infeed and outfeed conveyor and an operating position spaced from the infeed and outfeed conveyor, the machine being operable such that as one vacuum
30 chamber is performing the vacuum sealing operation, the other vacuum chamber is open for loading/unloading.

19. A method for packing products including:

acquiring information relating to one or more characteristics of products on a product packaging line;

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machine opening the mouth of each pack to a controlled extent based on information relating to one or more characteristics of the products being packed acquired at an upstream product information acquisition stage, and delivering or loading products into the open packs as the open packs are simultaneously delivered into a vacuum packaging machine or into the open packs which are already at least partially entered into the vacuum packaging machine.

10

20. A method according to claim 19 including also opening each pack by inserting one or more parts of the pack opener into the mouth of each pack and moving said part(s) to open the pack.

15

21. A method according to either one of claims 19 and 20 including acquiring via said product information acquisition stage, any one or more of height information, width information, height and width information, height, width and length information, volume or shape information, or weight information, in relation to the products.

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22. A method according to any one of claims 19 to 21 including supplying packs to the packing apparatus sequentially as individual products approach the packing apparatus on a conveyor.

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23. A method according to any one of claims 19 to 22 including making the packs on-line to a length tailored to the size of individual products by cutting and sealing bags from tubular stock.

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24. A method according to any one of claims 19 to 23 including supplying online bags of two or more widths, to a width selected for the size of individual products.

25. A method according to any one of claims 19 to 24 wherein the packs are plastic bags or sacks.

26. A method according to any one of claims 19 to 25 also including loading
5 products of different sizes into packs, via two or more generally parallel conveyors, a lesser number of the conveyors for smaller products and a greater number of the conveyors for larger products.

27. A method according to any one of claims 19 to 26, including:
10 providing a vacuum packaging machine having a plurality of vacuum chambers, each of the vacuum chambers being arranged to receive at least one unsealed product package and operable to perform an independent vacuum sealing operation on the product package(s), each vacuum chamber having a longitudinal direction defined by a path of travel of the respective product package(s) through the chamber, each vacuum chamber
15 having a sealing assembly therein for forming a heat seal across product packages which extends transversely to said longitudinal direction;
loading at least one unsealed product package into one of the vacuum chambers, such that the unsealed portion of the product package is located over the heat seal assembly or part of the heat seal assembly; and
20 simultaneously with the loading operation, performing an independent vacuum sealing operation on at least one product package in another one of the vacuum chambers.

28. A method as claimed in claim 27, wherein the method includes, following a loading operation and a vacuum sealing operation, closing the recently-loaded vacuum
25 chamber and performing a vacuum sealing operation on the product package(s) in that chamber, and substantially simultaneously with the vacuum sealing operation in the recently-loaded vacuum chamber, opening the recently-evacuated vacuum chamber and unloading the product package(s) from the recently-evacuated vacuum chamber and substantially simultaneously loading at least one unsealed product package into the
30 recently-evacuated vacuum chamber.

29. Apparatus for packing products, including:

a vacuum packaging machine for performing a vacuum sealing operation on product packages,

5 an upstream product information acquisition stage arranged to acquire information relating to one or more characteristics of the products on a product packing line, and

two or more generally parallel load conveyors arranged to deliver or load products of different sizes into packs and into the vacuum packaging machine, by a lesser number
10 of the conveyors for smaller products and a greater number of the conveyors for larger products.

30. A method for packing products, including:

15 acquiring information relating to one or more characteristics of products on a product packing line, and

delivering or loading products into packs and into a vacuum packaging machine via two or more generally parallel load conveyors, by a lesser number of the conveyors for
20 smaller products and a greater number of the conveyors for larger products.

31. Apparatus for packing products including:

a vacuum packaging machine for performing a vacuum sealing operation on product
25 packages,

an upstream product information acquisition stage arranged to acquire information relating to one or more characteristics of products on a product packing line, and

30 a pack opener arranged to automatically pick up individual packs from a supply of packs and open the mouth of each pack to a controlled extent based on information relating to products being packed acquired at the upstream product information acquisition stage, and to present the pack so that the products are delivered into the open

packs which are then delivered into the vacuum packaging machine, or deliver the products into the open packs which are already at least partially entered into the vacuum packaging machine.

5 32. Apparatus according to claim 31 wherein the pack opener includes one or more parts which insert into the mouth of each pack and more to open the pack.

33. Apparatus according to claim 32 wherein the parts which insert into the mouth of each pack comprise fingers which insert into the mouth of each pack.

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34. Apparatus according to any one of claims 31 to 33 wherein the product information acquisition stage is arranged to acquire any one or more of height information, width information, height and width information, height, width and length information, volume or shape information, or weight information, in relation to the products.

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35. Apparatus according to any one of claims 31 to 34 including a sub-system for supplying packs to the packing apparatus sequentially as individual products approach the packing apparatus on a conveyor.

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36. Apparatus according to any one of claims 31 to 35 including a sub-system for making the packs on-line to a length tailored to the size of individual products by cutting and sealing bags from tubular stock.

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37. Apparatus according to any one of claims 31 to 36 including a sub-system for supplying on-line bags of two or more widths, to a width selected for the size of individual products.

30

38. Apparatus according to any one of claims 31 to 37 wherein the packs are plastic bags or sacks.

39. Apparatus according to any one of claims 1 to 38 also including two or more generally parallel conveyors arranged to deliver products of different sizes into the packs, by a lesser number of the conveyors for smaller products and a greater number of the conveyors for larger products.

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40. Apparatus according to claim 39 comprising two parallel conveyors one of which is arranged to carry smaller products into the packs and both of which are activated to run in parallel to carry larger products into the packs.

10 41. Apparatus according to claim 39 including three or more generally parallel conveyors including a centre conveyor flanked on either side by one or more other conveyors.

15 42. Apparatus according to any one of claims 39 to 41 wherein the conveyors are arranged to deliver products into the packs by telescoping or moving forward into the packs to an extent dependent upon the size of the product, based on product size information previously acquired at the upstream product information acquisition stage.

20 43. Apparatus according to any one of claims 31 to 42 wherein the vacuum packaging machine includes a plurality of vacuum chambers each arranged to receive at least one unsealed product package and operable to perform an independent vacuum sealing operation on the product package(s), each vacuum chamber having a longitudinal direction defined by a direction of travel of the respective product package(s) through the chamber, each vacuum chamber having therein a heat seal
25 assembly for forming a heat seal across the product package(s) which extends transversely to said longitudinal direction.

44. Apparatus as claimed in claim 43, wherein the machine includes vacuum chambers which are arranged generally vertically one above each other.

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45. Apparatus as claimed in either one of claim 43 and 44, wherein the machine is configured to operate one of the vacuum chambers to perform the vacuum sealing

operation while another of the vacuum chambers is open for loading and unloading of product package(s).

5 46. Apparatus as claimed in any one of claims 43 to 45, wherein a heat seal assembly in each vacuum chamber is located at or adjacent the end of the chamber adjacent the infeed conveyor(s), and the infeed conveyor(s) is/are configured to load the product package(s) into the chamber with the unsealed portion(s) of the package(s) trailing.

10 47. Apparatus as claimed in any one of claims 31 to 46, arranged to simultaneously unload a sealed product package from a selected vacuum chamber and while loading another unsealed product package into the selected vacuum chamber.

15 48. Apparatus as claimed in claim 47 including two vertically-stacked vacuum chambers, an infeed conveyor and an outfeed conveyor, the vacuum chambers being synchronously vertically moveable between a loading/unloading position adjacent and between the infeed and outfeed conveyor and an operating position spaced from the infeed and outfeed conveyor, the machine being operable such that as one vacuum chamber is performing the vacuum sealing operation, the other vacuum chamber is open
20 for loading/unloading.

49. A method for packing products including:

25 acquiring information relating to one or more characteristics of products on a product packaging line,

30 automatically picking up individual packs from a supply of packs, machine opening the mouth of each pack to a controlled extent based on information relating to one or more characteristics of the products being packed acquired at an upstream product information acquisition stage, and delivering or loading products into the open packs and then into a vacuum packaging machine or into the open packs which are already at least partially entered into the vacuum packaging machine.

50. A method according to claim 49 including also opening each pack by inserting one or more parts of the pack opener into the mouth of each pack and moving said part(s) to open the pack.

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51. A method according to either one of claims 49 and 50 including acquiring via said product information acquisition stage, any one or more of height information, width information, height and width information, height, width and length information, volume or shape information, or weight information, in relation to the products.

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52. A method according to any one of claims 49 to 51 including supplying packs to the packing apparatus sequentially as individual products approach the packing apparatus on a conveyor.

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53. A method according to any one of claims 49 to 52 including making the packs on-line to a length tailored to the size of individual products by cutting and sealing bags from tubular stock.

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54. A method according to any one of claims 49 to 53 including supplying online bags of two or more widths, to a width selected for the size of individual products.

55. A method according to any one of claims 49 to 54 wherein the packs are plastic bags or sacks.

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56. A method according to any one of claims 49 to 55 also including loading products of different sizes into packs, via two or more generally parallel conveyors, a lesser number of the conveyors for smaller products and a greater number of the conveyors for larger products.

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57. A method according to any one of claims 49 to 56, including:
providing a vacuum packaging machine having a plurality of vacuum chambers, each of the vacuum chambers being arranged to receive at least one unsealed product package

and operable to perform an independent vacuum sealing operation on the product package(s), each vacuum chamber having a longitudinal direction defined by a path of travel of the respective product package(s) through the chamber, each vacuum chamber having a sealing assembly therein for forming a heat seal across product packages
5 which extends transversely to said longitudinal direction;
loading at least one unsealed product package into one of the vacuum chambers, such that the unsealed portion of the product package is located over the heat seal assembly or part of the heat seal assembly; and
simultaneously with the loading operation, performing an independent vacuum sealing
10 operation on at least one product package in another one of the vacuum chambers.

58. A method as claimed in claim 57, wherein the method includes, following a loading operation and a vacuum sealing operation, closing the recently-loaded vacuum chamber and performing a vacuum sealing operation on the product package(s) in that
15 chamber, and substantially simultaneously with the vacuum sealing operation in the recently-loaded vacuum chamber, opening the recently-evacuated vacuum chamber and unloading the product package(s) from the recently-evacuated vacuum chamber and substantially simultaneously loading at least one unsealed product package into the recently-evacuated vacuum chamber.

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